

Statement of
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U.S. Environmental Protection Agency Science Advisory Board
Before the Subcommittee on Environment, Technology and Standards
Committee on Science
U.S. House of Representatives
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Good morning Mr. Chairman and members of the Subcommittee on Environment, Technology and Standards. My name is Genevieve Matanoski. I am honored to appear before you today to present the conclusions of the EPA Science Advisory Board (SAB) on the EPA's FY 2005 Science and Research Budget Request. My comments today will summarize the views of the Board about that request for funding EPA's science and research programs during FY 2005. The Board will complete its full report on this issue by March 19, 2004 and with the permission of the Chairman, will submit that report for the record then.

1. Introductory Remarks

Over the last year the Board, under the leadership of its Chairman, Dr. William Glaze, has reorganized to make its advisory function as apparent as its peer review function. To take advantage of the benefits of this reorganization, the Board moved the EPA Science and Research advisory function from a small standing committee to the larger Board. This enhances the visibility of the review and increases the expertise available to conduct the evaluation. We will also be working with EPA to obtain information on the Agency's science and research programs on a systematic and continuous basis. The Agency now presents information to the Board in ways that correlate with their new Strategic Plan and which will ultimately include all science and research programs regardless of their funding source or where they are conducted within EPA.

2. Specific Comments on EPA's FY 2005 Science and Research Program and Budgets

a. Erosion of the EPA Research Budget

First, I want to mention that in past years, the Board has noted its deep concern with the constant erosion of EPA's research program budgets. For the FY 2005 budget, we now observe not just continued erosion, but a substantial cut to research funding. This continuous decrease in science and research funding severely constrains the ability

of the Agency to provide the necessary science to guide informed decision-making and to assist in reaching the nation's goals for human health and environmental risk reduction. The EPA has an outstanding group of scientists who conduct excellent basic and applied research focused on reducing both recognized problems such as air pollution, and the continually emerging problems arising from the past misuse of our environment.

b. Cuts to the STAR Program

In particular, the Board notes the substantial cuts in the FY 2005 budget request for EPA's Science to Achieve Results program (STAR). STAR is recognized by this Board as a science program of major importance to the Agency. That view is consistent with the views of the National Academy of Science in its 2003 review entitled "The Measure of STAR." STAR provides many benefits to EPA, including the necessary flexibility to obtain critical scientific expertise in the wide range of disciplines that are essential in addressing emerging issues that are outside EPA's current areas of expertise. EPA could never maintain the same large base of scientific expertise that is available on an as needed basis to carry out specific research. STAR enhances EPA's collaboration with outside researchers and academic institutions and in the process *actually stimulates additional resources for Agency science needs*. STAR also benefits and strengthens scientific research throughout the United States by providing training for graduate students who will reinforce the declining base of engineers and scientists in the U.S. Even though STAR is largely focused on EPA's core research, it has begun to accrue a record of early success. Evidence of this can be found in the NAS's "Measure of STAR" report in which it states that STAR research on endocrine disruptors, and ecologic assessment have already resulted in "...peer-reviewed publications that are of immediate use in understanding causes, exposures, and effects of environmental pollution." By any measure, STAR is an excellent investment.

To emphasize the seriousness of this situation, we note a number of cuts to STAR research which are a part of the FY 2005 budget request:

- i. Ecosystems Protection Research is reduced by over \$22 million with a loss of some 50 STAR grants based in many states. The Board is particularly concerned about this cut given the critical need for ecosystems research, which the Board feels is generally under-funded across EPA.
- ii. Endocrine Disruptors Research is reduced by about \$5 million. This is an area of research that investigates the effects that could be associated with use of many chemicals used in large quantities in our society.
- iii. Pollution Prevention Research is reduced by \$ 5 million even though the focus of this research is on avoiding future problems and reducing the expensive cleanup costs that we face today.
- iv. Mercury Research is reduced by \$2 million, just at the time when more information is needed on this ubiquitous contaminant.

In addition, even though the STAR Graduate Fellowship program increases by \$1.2 million over the FY 2004 level, it is still nearly \$4 million below the level enacted by Congress for FY 2003 (\$9.8 million). This program's aim is to educate the future environmental scientists that will be needed to replace the currently aging population of such scientists. Thus, adequate funding of this program continues to be essential.

The Board believes that these cuts will have a negative impact on the balanced research portfolio that EPA, especially ORD, has developed over the last decade. In that time, EPA has developed a program that balances its problem-driven (shorter term, applied) research with its core (longer term, basic) research. Though components of the core program are not always easy to identify in the budget, EPA appears to have a balanced research program, in this regard, with about half being "core" and half being "problem-driven." This seems to be appropriate.

Further, the STAR program helps EPA balance its internal research portfolio with its extramural research portfolio. The result is that science from many different institutions (government, academia, non-governmental organizations, and industry) is integrated into a total research program that complements the scientific niche filled by EPA's own scientists. This provides a more nimble resource that is available to work on existing and emerging environmental issues than would be available with only an intramural or an extramural program. Changes in this budget, especially to STAR, will significantly impair the balance of this integrated research program in both core vs. problem driven and intramural vs. extramural research dimensions.

c. Building Decontamination and Homeland Security

Another surprising change for which no satisfying explanation was offered was EPA's decrease in its commitment to Homeland Security. The Board believes that EPA must play a continuing role in Homeland Security in several areas. EPA's building decontamination research is one of EPA's contributions to Homeland Security and it is being eliminated in an \$8.3 million dollar cut prior to its completion. The Board is unsure as to why research on this important issue is being cut when it appears that further research is needed to provide rapid, on-target responses to contamination episodes. The Board is aware that other agencies have substantial resources devoted to Homeland Security, so perhaps other groups have taken on this role for the future. EPA has the special expertise to carry out this research. However, if it is judged that this is not a research direction for EPA, it is still important to ensure that this work be conducted somewhere.

2. Program Planning and Measurement

a. Program Assessment

Each year, the Board tries to evaluate EPA's research priorities and their role in meeting the Agency's goals. As part of the current review, the Board was given information resulting from the application of a new survey tool, the Program Assessment Rating Tool (PART) that was used to evaluate selected EPA programs. The Board is

concerned that decisions are being made about research program funding on the basis of the application of this new tool.

To be clear, the Board did not receive or review information on the rating instrument itself; however, after evaluating PART summaries for several research programs, our conclusion is that PART may, at this time, have a limited capacity to inform budget decisions on research programs. The Board's is concerned with the manner in which the weighting formula in PART seems to influence the full analysis and thus favor programs with short-run results over those having long term results. There is also concern that an evaluator's subjective considerations might be able to bias those weights and the rating itself.

Specifically, it appears that the weighting formula in the PART favors programs with near-term benefits at the expense of programs with long-term benefits. Since research inevitably involves more long-term benefits and fewer short-term benefits, PART ratings serve to bias the decision-making process against programs such as STAR ecosystem research, global climate change research, and other important subjects. The PART seems to be intended as a formula for predictions about likely program success. However, the weights that the PART assigns to different program characteristics do not seem to have been validated systematically against the contribution of each program characteristic to any independent objective measure of program success. If the weights in the tool are arbitrarily assigned, the PART may have characteristics that could lead to biases in evaluation that are related to the subjective judgments of its designers. We believe that the tool should be reviewed to determine its adequacy for its use in supporting budget decisions.

As the Board observed significant decreases in science and research funding, it also noted a substantial resource increase in the State and Tribal Assistance Grant account (STAG) for an initiative for retrofitting school busses. The Board does not challenge the worthiness of this program, rather it notes that it has no information on the science supporting this initiative. The Board trusts that the benefits of this program have been rigorously reviewed.

The real issue here is how research programs (and others) are to be evaluated and whether a different metric is necessary for basic vs. applied research programs. Also, of interest is whether research results should be evaluated separately from the outcomes of programs they are intended to support? Although the Board did not directly evaluate the PART itself, it is of obvious difficulty to conceive of a simple quantitative metric that could be applied across the broad areas of ecosystem quality, human health effects, endocrine effects, and technology development. The question is even more complex when you consider that some research is intended to develop limited data in the short-run to fill a specific knowledge gap and other research is intended to provide an understanding of whole systems in the long-term. Research program measurement is even more difficult because the knowledge and methods developed by EPA, especially ORD's researchers, are not usually directly applied by ORD, rather they are often used by others to support decisions on a broad suite of diverse statutory mandates. Thus, we believe that evaluations of the performance of research programs will need to consider

the specific factors of each program that the research is intended to support. Further, it is unlikely that simple formulas will be able to handle this task well. It is more likely that realistic research program performance assessment will need to be a combination of quantitative metrics and other information and analyses which is then evaluated by groups of experts with relevant knowledge.

I note that the NAS, in its review of STAR, also had concerns with quantitative routines used in performance assessments and noted that “The Committee judges that expert review by a group of people with appropriate expertise is the best method of evaluating broad research programs, such as the STAR program.”

b. Multi-Year Plans (MYPs)

Multi-Year Plans (MYPs) are an important innovation in EPA’s research planning process. The SAB has reviewed a limited number of these plans and the process used in their development and we believe that they will become more useful to the Board’s evaluation of EPA’s science and research, and its funding, in the future. MYP’s are tools that identify knowledge and methodology gaps needed to support EPA’s mission areas and the body of research that would address those needs. Further, they provide a basis for identifying annual performance goals and measures for efforts that become a part of EPA’s research budget. Finally, MYPs are very useful in providing focus on long term progress toward research goals, especially on cross-cutting subjects such as pollution prevention where coordination across the Agency is essential. The Board supports the continued refinement of Multi-Year plans and is available to continue its review of EPA’s progress in this regard.

3. EPA Science

My final comment will address an issue of great concern to the Board. Our analyses of EPA’s science and research budgets, today and in the past, convince us that the Agency is in danger of underestimating the pace of large scale changes that are now occurring in our society. If so, EPA and the nation are at risk of repeating the mistakes of the past that force us to spend huge sums of public funds to reduce and to clean up the pollution brought on by the first industrial revolution.

The evidence before us suggests that we are now in a new, high velocity technological revolution that will yield great economic gains, but at the same time, will offer new environmental challenges. Nanotechnology and biotechnology, to name only two innovations, are proceeding with breathtaking speed, and are compounded by forces such as global transfer of pollution and disease, and possible climate change. EPA must carefully examine all of its science and research programs and ask whether the Agency is conducting research that will help us protect human health and the environment while encouraging innovation and growth.

This is not to say that EPA should neglect the “legacy” issues of the past; rather, the Agency must continue to resolve those problems, and at the same time, work with

citizen's groups, industry, and academia in creative ways to ensure that the nation avoids a new legacy of human health and environmental problems.

The Board would be pleased to work with EPA to explicitly address ways in which EPA science and research might be focused to help EPA develop, and use to the fullest, knowledge that will be instrumental in avoiding a negative legacy.

I want to express my gratitude to the Members of the Sub-Committee for inviting me to testify about EPA's science and research. I would be pleased to answer your questions.

Thank you.